The Objections to the Drawings

The Examiner objected to the drawings in items 1 and 2 on page 2 of the Office Action. Applicants provide proposed drawing corrections in red ink for Figures 1-7 and 9 with this response, including an accompanying Letter to the Examiner Requesting Approval of the Changes to the Drawings. The Applicants have also changed the term "guide plate 2" to "scattering guide plate 2" in the specification. Accordingly, Applicants respectfully request withdrawal of the objections to the drawings.

Changes to the Specification

The specification has been reviewed in response to this Office Action. Changes have been made to the specification to place it in preferred and better U.S. form for issuance and to reflect the proposed changes to the drawings submitted with this response. No new matter has been added.

Rejections Under 35 U.S.C. §112, First Paragraph

In item 5 on page 3 of the Office Action, the Examiner rejected claims 1-9 under 35 U.S.C. §112, first paragraph, because the Examiner asserted that there is no teaching in the specification or drawings that the rough area has a roughness that is smaller than that of the light scattering elements. Applicants respectfully traverse this rejection. Page 5, lines 3-4 and page 9, lines 1-4, for example, teach that the rough area has a roughness that is smaller than that of the light scattering elements. Accordingly, Applicants respectfully request withdrawal of the rejection to the claims under §112, first paragraph.

Rejections Under 35 U.S.C. §112, Second Paragraph

In item 7 on page 3 of the Office Action, the Examiner rejected claims 1-9 under 35 U.S.C. §112, second paragraph, as being indefinite for the reasons set forth therein. Applicants respectfully traverse this rejection for the following reasons.

The inner surface of a mold used to produce the scattering guide plate 2 is locally roughened to form the light scattering elements 14 by, for example, applying mat-processing to form circular (dot-like) roughened portions (specification at page 9). This roughening process is followed by another roughening process that roughens the whole inner surface portion of the mold to form a rough surface over the area M among the light scattering elements 14 (specification at page 11). The roughening processes are performed so that the rough area M has a degree of roughness (i.e., scattering power) that is less than that of the light scattering

elements 14. Accordingly, Applicants respectfully request withdrawal of the rejections to the claims under §112, second paragraph.

Rejections Under 35 U.S.C. §103(a)

In item 9 on page 4 of the Office Action, the Examiner rejected claims 1-9 under 35 U.S.C. §103(a) as being unpatentable over Ishikawa et al. (U.S. Patent No. 6,027,221) in view of Seki et al. (U.S. Patent No. 4,519,686). Applicants respectfully traverse this rejection for the reasons presented below.

Claim 1 of the present invention, as amended, recites "said emission face is provided with a plurality of light scattering elements distributed according to a predetermined pattern and a rough area formed among said light scattering elements, said rough area having a roughness degree which is less than that of said light scattering elements." Independent claims 4 and 7 recite similar language.

Ishikawa does not disclose that the emission face of the guide plate has a large number of light scattering elements and that the rough area formed among the light scattering elements has a degree of roughness that is less than that of the light scattering elements, as indicated by the Examiner on page 4 of the Office Action. The Examiner relies on Seki as disclosing these features.

Seki relates to a focusing screen used in the optical finder of a camera that has a surface formed with a large number of hemispherical faces of irregular sizes that are arranged irregularly (Seki at abstract and col. 1, lines 6-8). In Seki, a surface of a focusing screen is sandblasted to form a number of fine concavities and convexities. At this point, the light transmitted through the focusing screen from an objective lens to an eye-piece portion is diffused within a wide angle range, causing the percentage of the light directed to the eye-piece portion to be small and the finder picture plane to be dark. See Seki at col. 1, lines 10-24. The focusing screen is then immersed in a chemical etching reagent to change the projections formed by the concavities and convexities into hemispherical surfaces having irregular sizes and an irregular arrangement. See Seki at col. 1, lines 44-51. The hemispherical projections of Seki make the angle distribution of the diffused transmitted light smaller. As a result, more light is directed to the eye-piece portion. See Seki at col. 1, lines 53-63.

The guide plate of the present invention and the focusing screen of Seki have different purposes and are designed to solve different problems. The focusing screen 10 of Seki has a focal plane 2 onto which an image of an object is focused. Light for focusing the image is provided from a back face of the focusing screen 10, as shown in Fig. 2B of Seki. In contrast,

the guide plate of the present invention is used in a surface light source device of side light type for illuminating an LCD. Accordingly, light is supplied from the side of the guide plate (i.e., at an incidence end face provided by a minor face). This light is not focused, as in Seki, but is emitted from an emission face (provided by a major face). Thus, the guide plate of the present invention operates to convert the direction of light supplied from the side to a frontal direction so that light is emitted uniformly from the emission face. The large number of scattering elements and rough area are formed to promote emission from the emission face of the guide plate in the present invention. However, in Seki, because the light for focusing the image comes from the back face of the focusing screen, promotion of emission from the focusing screen is not needed. Therefore, the guide plate of the present invention differs from the focusing screen of Seki in both function and design.

Claim 1 also specifies that the light scattering elements are distributed according to a predetermined pattern. The predetermined pattern is designed according to the degree of emission promoting power required. Where more brightness is needed, a higher covering rate is provided to avoid brightness reduction. Thus, brightness is uniformly distributed. In contrast, the hemispherical surfaces of Seki are irregular and have an irregular arrangement.

As for the dependent claims, the dependent claims depend from the above-discussed independent claims and are patentable over the prior art for the reasons discussed above.

CONCLUSION

It is submitted that none of the references, either taken alone or in combination, teach the present claimed invention. Thus, claims 1-9 are deemed to be in a condition suitable for allowance. Reconsideration of the claims and an early Notice of Allowance are earnestly solicited.

If there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

Finally, if there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: 9/14/01

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CERTIFICATE UNDER 37 CFR 1.8(a)

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231

on Sept. 14, 2001

STASS & HALSEY

By: C. Joan Gilsdorf

Date: 9/14/01

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please **REPLACE** the paragraph beginning at page 5, lines 19 to 20 as follows:

Fig. 1a is a cross section illustrating a surface light source device of side light type in accordance with an embodiment of the present invention;

Fig.1b is an enlarged partial view illustrating an example of a light scattering element and a rough area of the present invention;

Fig. 1c is an enlarged partial view illustrating another example of a light scattering element and a rough area of the present invention;

Please **REPLACE** the paragraph beginning at page 5, lines 21 to 22 as follows:

Fig. 2a is an exploded perspective view of the surface light source device shown in Figs. 1a to 1c;

Fig. 2b is an enlarged partial view illustrating fine projection rows on a back face of a scattering guide plate of the present invention;

Fig. 2c is an enlarged partial view illustrating fine projection rows on a back face of a prismatic surface of a prism sheet of the present invention;

Please **REPLACE** the paragraph beginning at page 5, lines 23 to 24 as follows:

Fig. 3a is a plan view of an emission face of a scattering guide plate employed in the surface light source device shown in Figs. 1a to 1c;

Fig. 3b is an enlarged partial view illustrating light scattering elements around a corner portion of the emission face of Fig. 3a;

Fig. 3c is an enlarged partial view illustrating light scattering elements around a distal portion of the emission face of Fig. 3a;

Please **AMEND** the paragraph beginning at page 6, lines 7 to 12 as follows:

Referring to Figs. [1 and 2] 1a to 2c, a surface light source device of side light type 1 comprises a scattering guide plate 2, a primary light source 3, a reflection sheet 4 and a flexible prism sheet 5 as a light control member. The reflection sheet 4, the scattering guide plate 2 and the prism sheet 5 are laminatedly arranged. The scattering guide plate 2 has a wedge-like cross section with a thicker end [potion] portion having a minor face to provide an incidence end face 2A beside which the primary light source is disposed.

Please **AMEND** the paragraph beginning at page 6, lines 18 to 23 as follows:

The reflection sheet 4 is, for example, a sheet-like member with regular reflectivity provided by evaporation-deposited silver or a sheet-like member such as white PET film. A major face 2C of the scattering guide plate 2 provides an emission face while the other major face 2B provides a back face. Although some light leaks through the back face 2B, the reflection sheet 4 reflects and returns the leaked light to the scattering guide plate 2. This prevents loss in light energy.

Please **AMEND** the paragraph beginning at page 7, line 11 to 16 as follows:

Illumination light L emitted from the emission face 2C is introduced into the prism sheet 5 through a slope 5B, shown in Fig. 2c indicated with arrow C, relatively near to the incidence end face 2A and is reflected at another slope 5A, shown in Fig. 2c indicated with arrow C, relatively far from the incidence end face 2A to be outputted to a frontal direction of the emission face 2C (upward in Fig. 1a). Thus the prism sheet 5 corrects directively of emission to a frontal direction of the emission face 2C regarding in a plane perpendicular to the incidence end face 2A.

Please **AMEND** the paragraph beginning at page 7, line 21 to 26 as follows:

On the other hand, [referring to a circled partial enlarged illustration with arrow B,] referring to Fig. 2b indicated with arrow B, the back face 2B of the scattering guide plate 2 is also provided with a great number of fine projection rows. These projection rows run approximately at a right angle with respect to the incidence end face 2A. Each of the projection rows includes a pair of slopes 2E, 2F running approximately at a right angle with respect to the incidence end

face 2A.

Please **AMEND** the paragraph beginning at page 8, line 29 to page 9, line 4 as follows:

In the illustrated embodiment, the light scattering elements 14 are locally formed fine rough regions. It is to be noted that the rough area M has scattering power which is smaller that that of the light scattering elements 14. That is, [as shown in a circled illustration in Fig. 1 with reference indication of E and F,] as shown in Figs. 1b and 1c with indications of E and F, degree of roughness is lower in the area M than in the fine rough regions corresponding to the light scattering elements 14.

Please **AMEND** the paragraph beginning at page 9, line 16 to line 20 as follows:

In the present embodiment, number of scattering elements per unit area (i.e., covering rate) is increased in an area indicated by reference symbol AR1, as understood by comparing a partially enlarged illustration of Fig. 3b with another partially enlarged illustration of Fig. 3c [in Fig. 3]. That is, the light scattering elements 14 are distributed at a relatively large density in corner portions corresponding to electrodes 7A, 7B of the fluorescent lamp 7 and in tapering areas extending therefrom respectively.

Please **AMEND** the paragraph beginning at page 10, line 14 to 18 as follows:

An example of thus determined boxes are illustrated in [Fig. 3] Figs. 3a to 3c with dotted lines. One scattering element 14 is allotted to one box. Position in each box is preferably random. Such random positioning prevents Moire fringes which might be caused by overlapping relation with pixels of the LCD panel. However, so far as Moire fringes are tolerable, an arrangement with regularity may be employed.

Please **AMEND** the paragraph beginning at page 10, line 19 to 22 as follows:

In the example shown in [Fig. 3] Figs. 3a to 3c, pitch P is adjusted so that reduction for correction with respect to the provisionally set value is increasing in the area AR1 according to being closer to the incidence end face and also to being closer to the corners along the

incidence end face 2A.

Please **AMEND** the paragraph beginning at page 11, line 12 to 14 as follows:

Inner surface of a mold employed for producing the scattering guide plate 2 is locally roughened for forming the light scattering elements 14. The positions of being roughened correspond to the forming positions of the light scattering elements 14.

IN THE CLAIMS:

Please **AMEND** the following claims:

1. (ONCE AMENDED) A surface light source device of side light type comprising:

a guide plate having a minor face to provide an incidence end face and two major faces to provide an emission face and a back face; and

a primary light source [arranged so that the guide plate is supplied with] providing primary light to the guide plate through the incidence end face, wherein

said emission face is provided with a [great number] plurality of light scattering elements distributed according to a predetermined pattern and [is provided with] a rough area formed among said light scattering elements,

said rough area having a roughness degree which is [smaller] less than that of said light scattering elements.

4. (ONCE AMENDED) A liquid crystal display including a liquid crystal display panel and a surface light source device of side light type for backlighting [of] the liquid crystal display panel, said surface light source device comprising:

a guide plate having a minor face to provide an incidence end face and two major faces to provide an emission face and a back face; and

a primary light source [arranged so that the guide plate is supplied with] providing primary light to the guide plate through the incidence end face, wherein

said emission face is provided with a [great number] plurality of light scattering elements

distributed according to a predetermined pattern and [is provided with] a rough area formed among said light scattering elements,

said rough area having a roughness degree which is [smaller] less than that of said light scattering elements.

7. (ONCE AMENDED) A guide plate of a surface light source device of side light type, [having] comprising:

a minor face to provide an incidence end face for introducing light into the guide plate; and

two major faces to provide an emission face for emitting light and a back face opposite said emission face,[; and a primary light source arranged so that the guide plate is supplied with primary light through the incidence end face,] wherein

said emission face is provided with a [great number] plurality of light scattering elements distributed according to a predetermined pattern and [is provided with] a rough area formed among said light scattering elements,

said rough area having a roughness degree which is [smaller] less than that of said light scattering elements.

IN THE ABSTRACT:

Please **AMEND** the abstract as follows:

A [LCD panel is illuminated from its back side by a] surface light source device of side light type illuminating an LCD panel and comprising a guide plate, a primary light source, [(fluorescent lamp and reflector),] a reflection sheet, and a prism sheet for [as a] light control [member]. [Light scattering pattern and rough area M are formed on an emission face of the guide plate. The light scattering pattern consists of a great number] A plurality of fine light scattering elements and rough area M are formed on an emission face of the guide plate. The rough area M is formed among the light scattering elements and has scattering power [which is] weaker than that of the light scattering elements. The dot-like light scattering elements are distributed according to a certain pattern[. This pattern] that is designed to promote emission. [depending on necessity of promotion of emitting. Emitting] Emission is promoted [in not only

portions] where the light scattering elements are formed [but] and also in the area M [among them]. Accordingly, fine periodic bright-dark unevenness and glaring are [hard to appear.] reduced and the [And even when an additional member such as] prism sheet, [is] disposed [directly] on the emission face, [the additional member] is prevented from sticking to the emission face. [The rough area M has roughness practically falling within a range from 0. 02 to 0.25 μ m.

(Fig. 1)]